Financial and Project Support Resources for Clean Energy and Resource Business in Western Massachusetts

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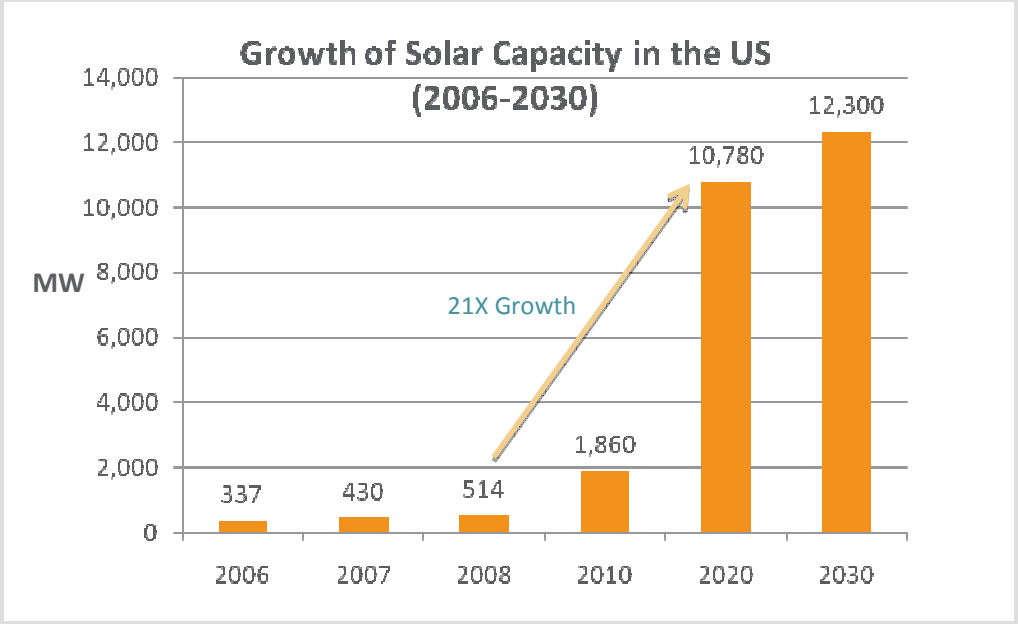
The US solar market is poised for tremendous growth

- **US market size in 2008 was 514 MW, approximately a $2.5 billion market.** The market has been comprised predominantly of small scale, distributed solar projects, namely residential or commercial rooftop projects. The largest US PV project in 2008 was 14 MW.
- **The annual US market size is expected to be larger than 10,000 MW by 2020, a $40 billion market.** All segments – residential, commercial and utility-scale – will drive this growth, but it is the emergence of utility scale projects which will be the primary driver of this volume, where utilities own or procure power from large scale solar power plants.
- **The US market is poised for 21 X growth over the next 12 years.**



Source: US Department of Energy, Institute for Energy Research, 2009

US solar market fundamentals

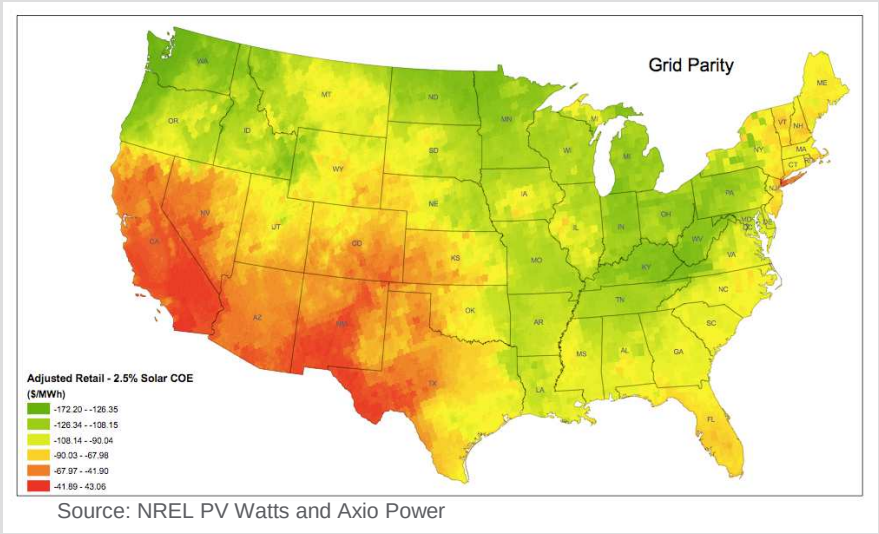
The US is expected to emerge as the world's largest solar market by 2012 because of it favorable market fundamentals:

•**Solar radiation**, or the amount of "solar fuel" available, is among the strongest in the world. An abundant solar fuel source is a primary driver of a low cost of solar energy.

•**Co-location of resource, infrastructure and electricity loads**. Unlike other global desert regions, solar rich areas in the U.S. desert Southwest are co-located with some of the largest and most expensive power markets, namely California, which relies heavily on natural gas fired power.

•**Grid parity** is the price at which solar energy becomes a viable economic alternative to building natural gas fired peaking facilities. Axio's management anticipates grid parity in select US markets within the next 2-3 years.

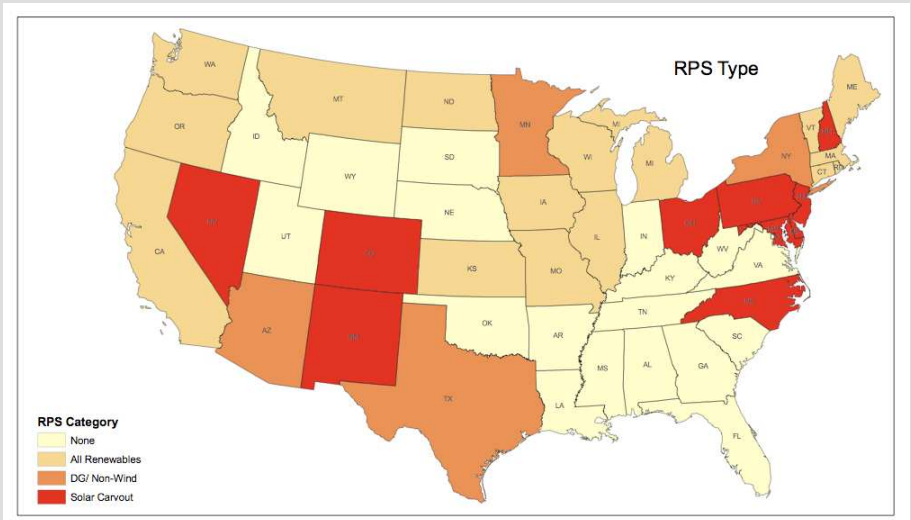
•**Improving regulatory environment**. After a period of intermittent and uncoordinated energy policy, the US regulatory environment for renewables, both at the Federal and State level, is driving increased stability in US solar markets.



Source: NREL PV Watts and Axio Power

Growth driven by favorable government policy

- **Economic growth of US markets is supported by favorable policy at both the Federal and State level.** Solar markets have long relied on state initiative such as renewable portfolio standards (RPS) to drive growth. RPS mandates call for utilities to procure a defined minimum of renewable energy, even at above market rates. 24 US states have some form of RPS in place, some of which mandate a specific carveout for solar.
- **2009 has witnessed the emergence of Federal leadership in renewable energy policy.** The most critical federal incentive, a 30% Investment Tax Credit (ITC) was extended through 2016. A total of $97 billion has been earmarked from the federal stimulus package and American Recovery and Reinvestment Act (ARRA) for renewable energy. A National Renewable Electricity Standard (RES) has been passed in a House bill which also seeks to implement a carbon dioxide limiting regime for utilities. A Department of Energy loan guarantee program estimated at $60 billion has offered relief to projects unable to secure financing in 2009 and 2010.
- **The regulatory environment for solar in the US has never been stronger.**

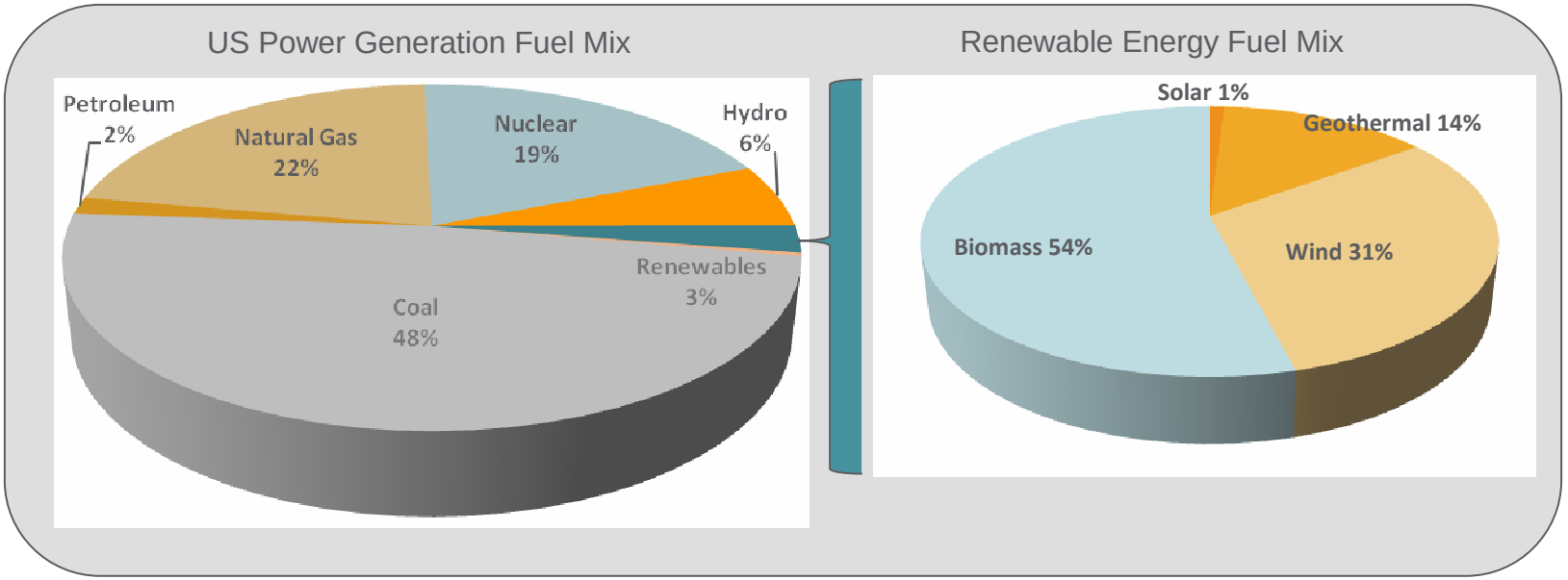


Uncapped growth potential for solar

- **Renewable energy accounts for 3% of power generated in the US today.** Coal accounts for nearly half of all power generated in the US, followed by 22% from natural gas, and 19% from nuclear energy. Given policy favorable to renewables, and limiting to the growth of CO2 emitting sources, the renewable portion of our US portfolio is the fastest growing energy sector in the US.

- **Solar is only 1% of the total renewable energy market in the US today.** Even among the limited pool of renewable energy assets in the US today, solar is still a relatively small player behind biomass, geothermal, and wind. With biomass constrained by impending carbon legislation, solar will be a key growth driver for renewable energy.

- **Growth potential for solar is effectively uncapped**. Solar is expected to grow from 0.02% of all power generated in the US in 2008 to 0.46% by 2020. Depending on the pace of solar innovation, the shape of declining cost curves, and the stability of fossil fuel-based alternatives, *solar faces no significant limits to its growth within the context of a growing US energy supply.*



Solar market segmentation by project size

- **Solar industry segments have evolved dramatically and will continue to evolve.** Since the emergence of solar PV technology 40+ years ago, solar power generation was typically reserved for off-grid applications including remote and extra-terrestrial (satellite and space program) applications. Solar applications evolved over time to be interconnected to the grid, resulting in a robust grid-tied market for residential and commercial customers, and a limited number of utility customers.

- **Utility scale solar applications were traditionally reserved for solar thermal technologies.** Solar thermal technologies have dominated utility scale projects larger than 50 MW, but this is changing; the declining costs of PV have spurred the creation of ever larger utility-scale solar PV plants and created a new segment of "small" utility scale projects generally referred to as wholesale distributed generation (WDG).

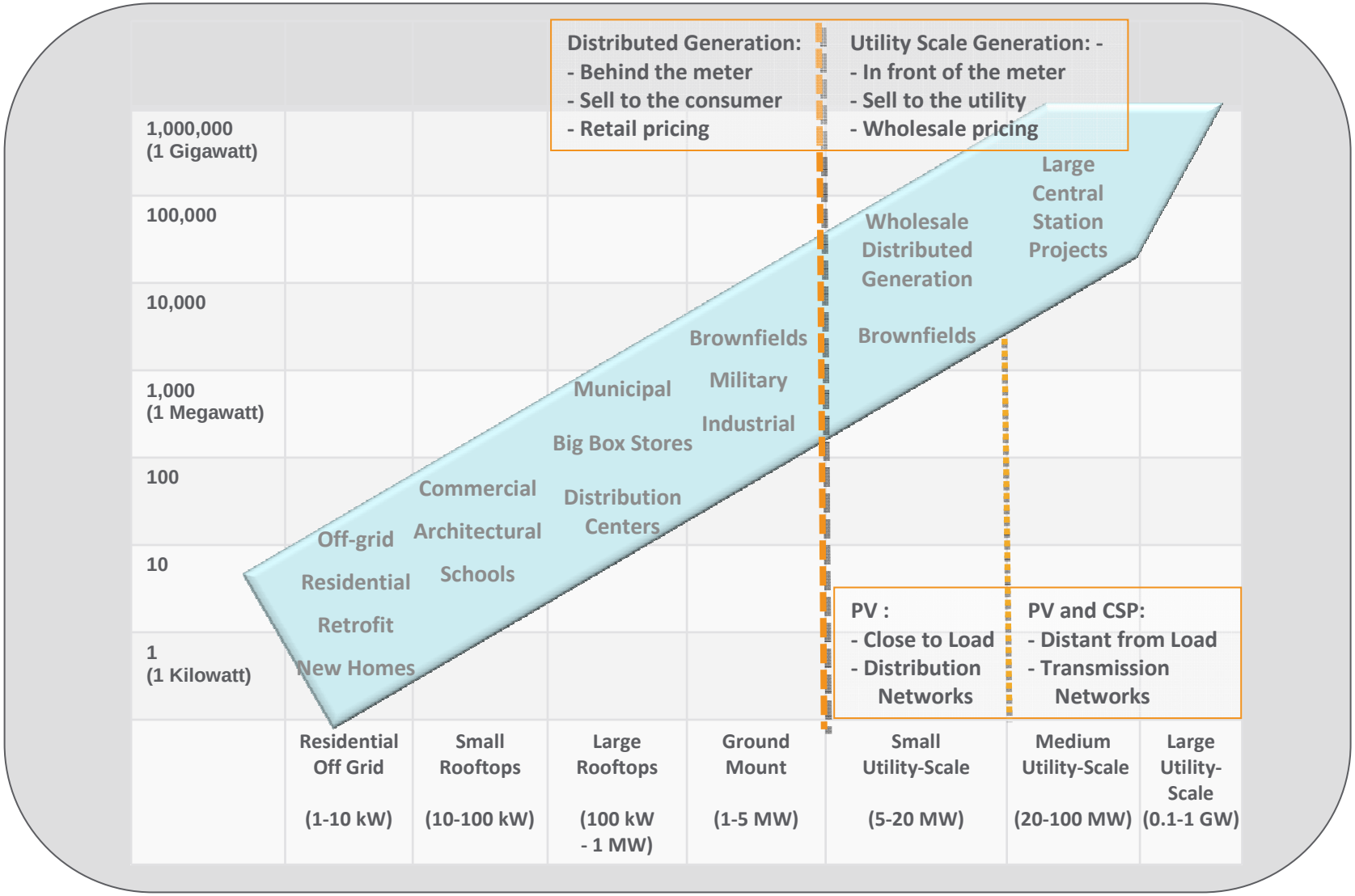
- **All solar segments will experience tremendous growth but WDG is particularly well-positioned to grow.** The efficiency of co-locating a power generation source close to loads, constraints on transmission capacity, and constraints on available land near load centers make projects in the range of 5 to 50 MW particularly attractive targets for the delivery of power to utilities.

Distributed Generation (Retail)			Utility Scale (Wholesale)	
Residential <10 kW	Small /Medium 10-200 kW	Large 200 kW – 5 MW	Wholesale Distributed Generation ~5-20 MW	Central Station >20 MW
PV	PV	PV	PV	PV and Solar Thermal




Solar market segmentation by project size

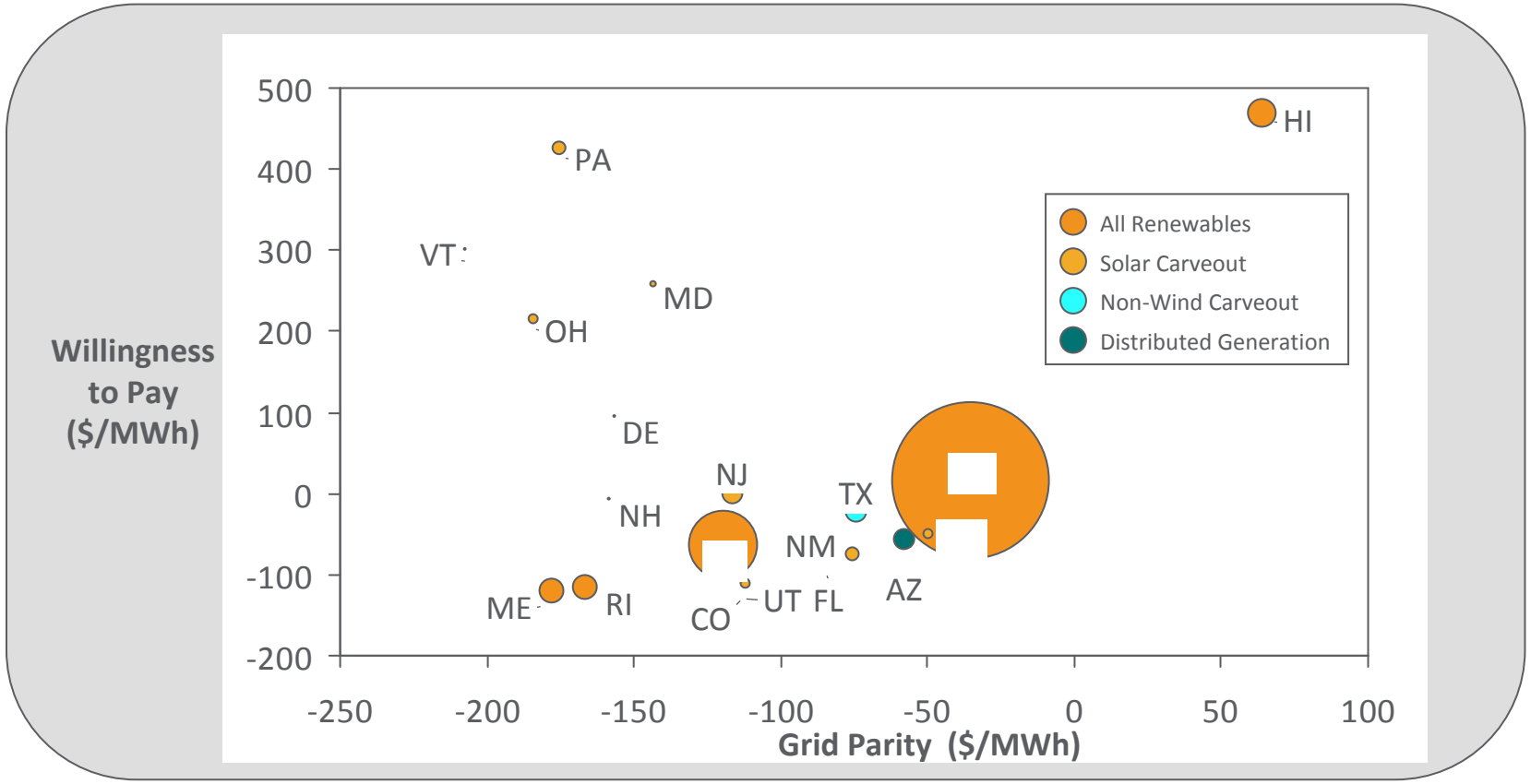
The following chart depicts the range of solar segments and project sizes in the market today:



Segmentation by geography and regulatory regime

Axio assesses the relationship between regulatory and economic drivers:

- **Grid parity**: which markets are moving toward grid parity where solar will be competitive with conventional sources in the foreseeable future?
- **Willingness to pay:** which markets have compliance regimes that require utilities to pay penalties, typically alternative compliance payments (ACP's) for non-compliance with an RPS?
- **Market size**: what is the relative size and expected volume in each state or utility market?



Unique experience: brownfields

Axio has carved out a leading market position in "brownfield" redevelopment. The use of pristine, greenfield land for solar development can be costly and controversial. In many locations the best solar sites are former industrial lands, landfills, or brownfields which offer the following characteristics and benefits:

•**Alternate uses of the site are limited** by the actual or suspected presence of pollution/contamination.

•**Owners and communities are interested in converting brownfield properties into more economically productive uses.**

•**Brownfields are often proximate to electricity loads and underutilized transmission and distribution infrastructure** which supported the brownfield's previous industrial uses.

•**Federal and state incentive programs** provide additional economic benefits to owners and developers to clean up brownfield sites and restore them to an alternate use.

The front page of 2009 EPA brochure on "RE-Powering America's Land" featured two projects: Ft. Carson PV and Steel Winds. Both projects were developed by Axio management.

Growing demand for solar energy

- **Demand for solar energy has grown exponentially in the last decade** as a function of the declining costs of solar power, the escalating costs of conventional power generation, and favorable government policies put in place to incent the production and procurement of renewable energy.

- **Utilities increasingly seek renewable energy to meet their future energy needs** both to secure predictably priced sources of peaking power, and to comply with growing government and regulatory mandates for the use of clean, renewable energy.

Global Energy Demand
- China builds 2 coal plants per week*
- Global policies govern CO2 reduction
- Potential for solar to "leapfrog" existing technologies

Government Policy
- State and Federal Renewable Energy Standards
- National security & freedom from foreign oil
- Hi-tech, clean tech job creation

Public (and Voter) Demand
- 57% of population sees global warming as a 'very serious' issue**
- Bi-partisan appeal to voters
- Affordable residential systems & financing

US Utility Demand
- Mitigate fossil fuel inflation/volatility
- Long term predictable power contracts, zero fuel cost
- Offset need for transmission

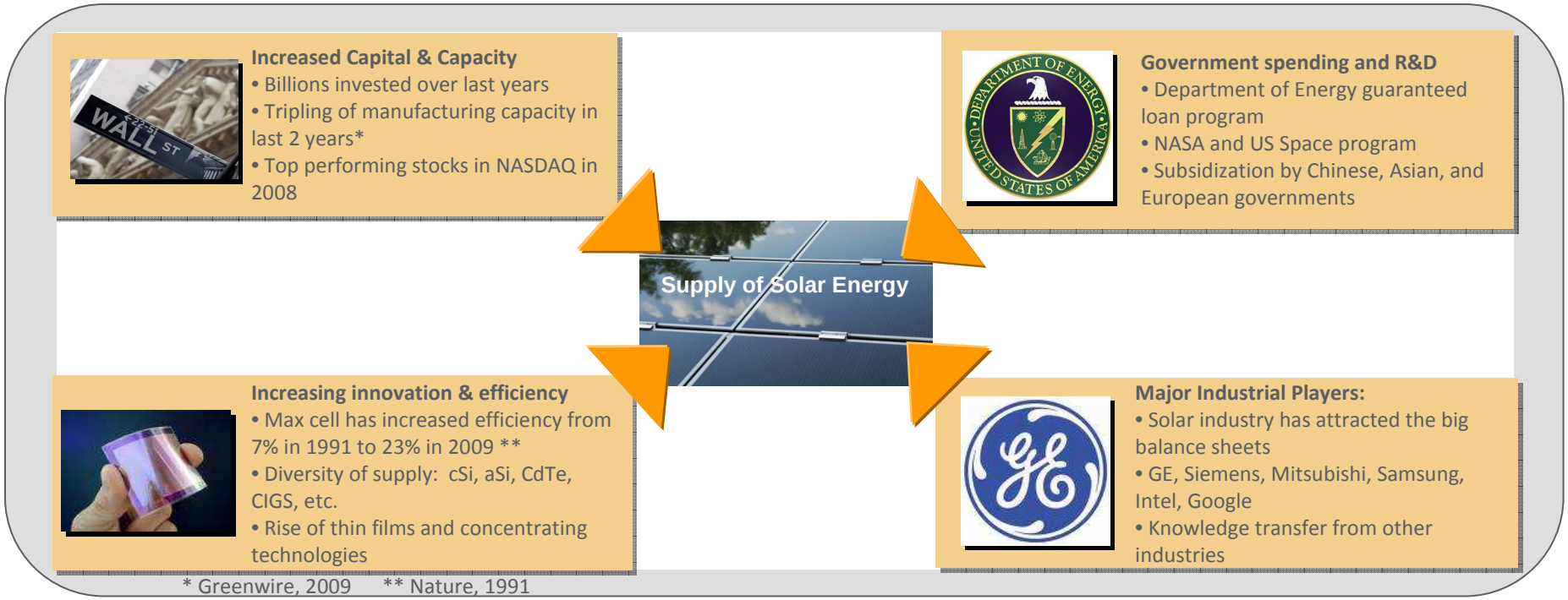
* BBC, 2007 **ACNielsen, 2007

Rapidly growing supply base

- **Global investment in solar has grown from $66 million in 200 to $12.4 billion in 2007**. As a result of heavy inflows of capital, global manufacturing capacity increased six fold from 2004 to 2008.

- **The proliferation of many new and potentially disruptive solar PV technologies** has been advanced by government and industry R&D investments which, propelled by economies of scale and learning, has led to growing module efficiency, decreasing costs of production, and decreasing cost of solar energy.

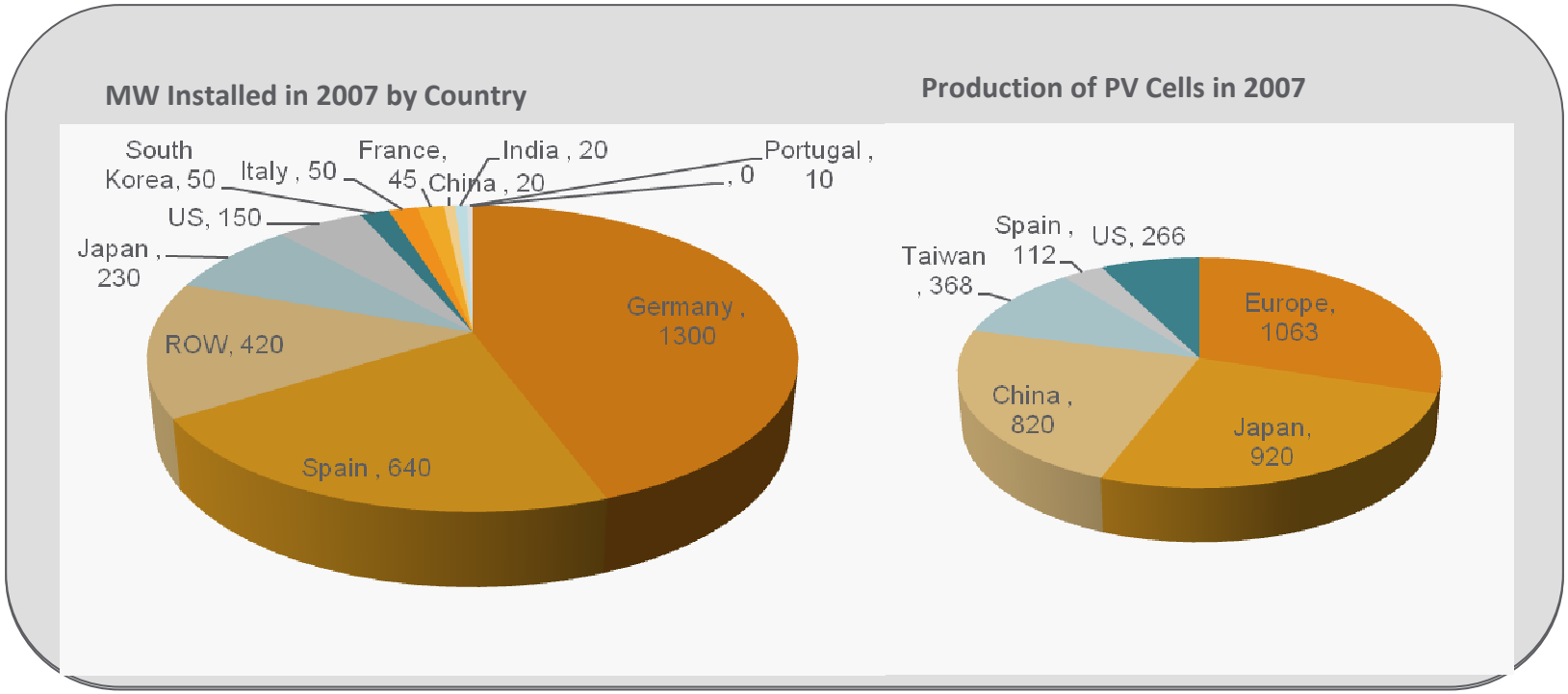
- **2009 has witnessed a significant overhang in solar PV supply and cost decreases as high as 50%.** The massive investment in recent years and growth of manufacturing capacity, combined with decreased demand in 2009 has resulted in a significant supply/demand imbalance which is expected to remain unresolved for the foreseeable future, greatly benefitting project developers like Axio.



* Greenwire, 2009 ** Nature, 1991

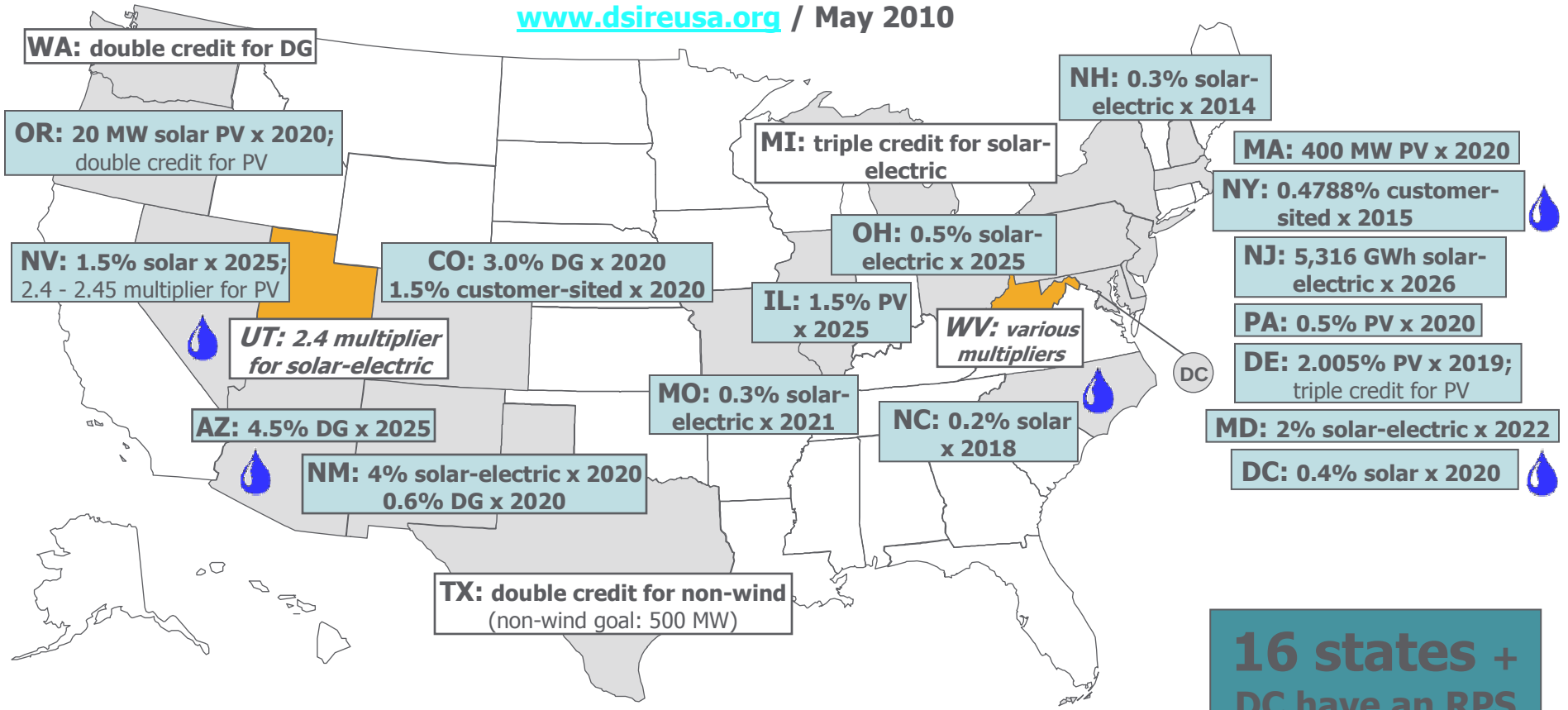
Explosive growth in global solar installed base

- **Nearly 6 GW of solar was installed during 2008, more than doubling the 2.8 GW installed in 2007, and over 7 GW of solar was installed in 2009.** Given troubled financial markets in 2009 and the decline of large European feed-in tariff (FIT) markets , such as Spain, installations were expected to revert to 2007 levels. Despite predictions, 2009 saw a growth of over 1 GW and an even more aggressive growth trajectory has been seen in 2010 with an estimated 14.1 GW expected to be installed worldwide by the end of 2010 (GTM Research).
- **The US is expected to emerge as the world's largest solar market by 2012.** While global growth has been driven by foreign markets in the past 5 years, particularly European markets, the US is expected to emerge as the worlds largest solar market.
- **With 10,000 MW forecast to be installed by 2020, the US market will represent an approximately $40 billion opportunity.**



RPS Policies with Solar/DG Provisions

www.dsireusa.org / May 2010



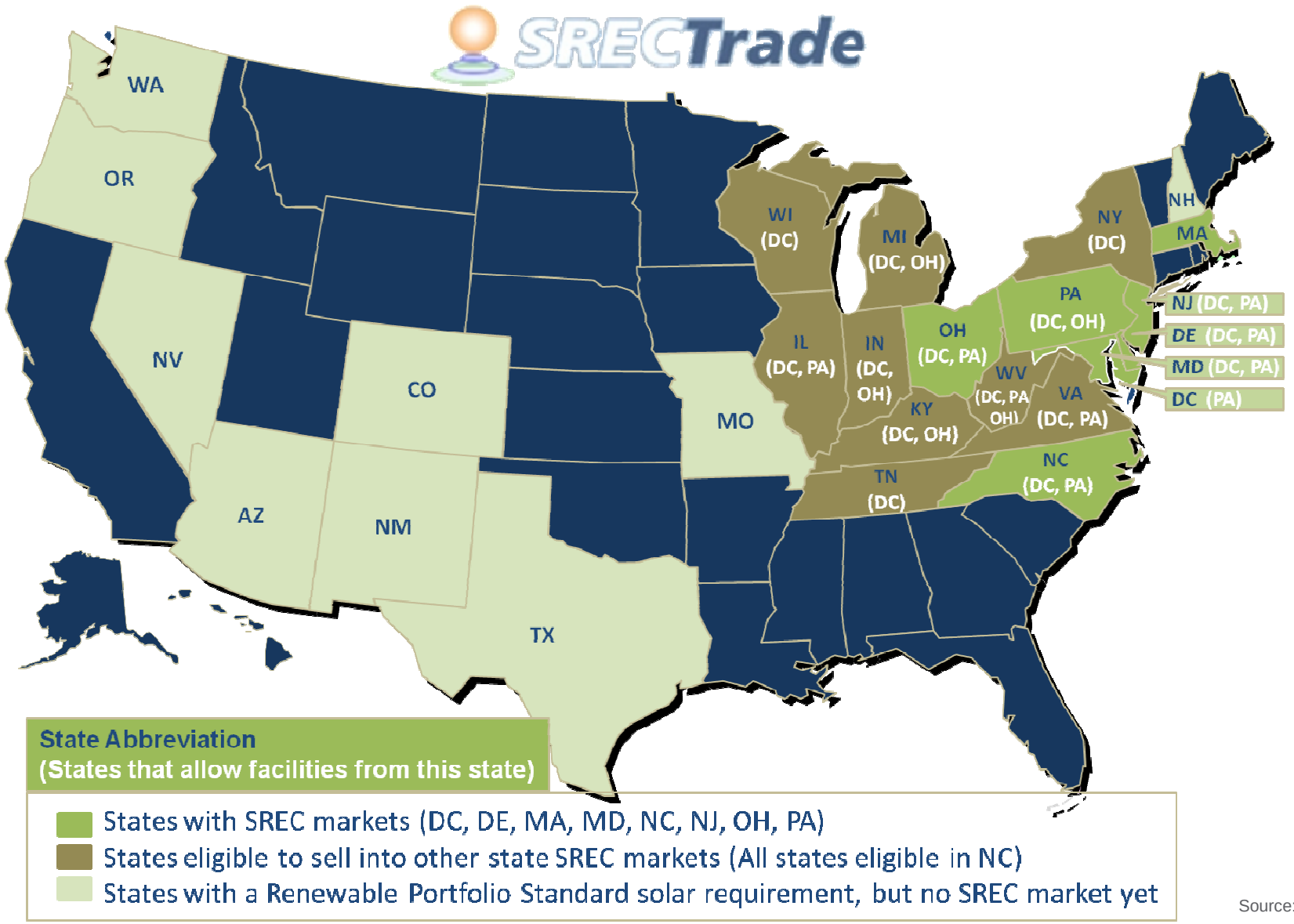
State renewable portfolio standard with solar / distributed generation (DG) provision

State renewable portfolio goal with solar / distributed generation provision

Solar water heating counts toward solar provision

16 states + DC have an RPS with solar/DG provisions

*Source: DSIRE



Source: SRECTrade